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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP 1100 SUPERIOR AVENUE, SEVENTH FLOOR CLEVELAND, OH 44114			ALAVI, ALI	
			ART UNIT	PAPER NUMBER
			2875	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,942

Applicant(s)

DU ET AL.

Examiner

Ali Alavi

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15-31 and 33-42 is/are rejected.
- 7) ☒ Claim(s) 13, 14 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12, and 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Schoniger et al (US Pat. No 5,136,483).

Regarding claim 1, Schoniger discloses a light source comprising: a light emitting semiconductor device (14, fig. 3), and a support substrate having a generally planar reflective surface (16, fig. 3) that supports the semiconductor device, the light emitting semiconductor device heat sinking (19, fig. 3) via the support substrate (16), and a curved reflector having a concave parabolic reflective surface (fig. 3), the light emitting semiconductor device arranged between the generally planar reflective surface and the concave parabolic reflective surface, the support substrate and the curved reflector together defining a light aperture (10, fig. 2) through which light produced by the light emitting semiconductor device passes.

Regarding claim 2, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that the planar reflective surface and the concave parabolic reflective surface cooperate to reflect light produced by the light emitting semiconductor device that is directed toward one of the planar reflective surface and the

concave parabolic reflective surface toward the light aperture along a direction generally parallel to an optical axis of the concave generally parabolic surface (fig. 3).

Regarding claim 3, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that an optical axis of the concave generally parabolic surface coincides with the planar reflective surface (fig. 3).

Regarding claim 4, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device is centered at an optical focus of the concave generally parabolic surface (fig. 3).

Regarding claim 5, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device is positioned with a first edge substantially aligned with an optical focus of the concave generally parabolic surface, the light emitting semiconductor device extending from the first edge away from the light aperture (figs. 1&3).

Regarding claim 6, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device is positioned with a first edge substantially aligned with an optical focus of the concave generally parabolic surface, the light emitting semiconductor device extending from the first edge away from the optical focus along an optical axis of the concave generally parabolic surface (fig. 3).

Regarding claim 7, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that the curved reflector a light transmissive encapsulant that encapsulates the light emitting semiconductor device and at least a portion of the

generally planar reflective surface, the encapsulant including a convex generally parabolic encapsulant surface, and a reflective layer disposed on the convex generally parabolic encapsulant surface, an interface between the reflective layer and the encapsulant corresponding to the concave generally parabolic surface of the curved reflector (fig. 3, col. 3, lines 28-32).

Regarding claim 8, Schoniger discloses the claimed invention as applied above in claim 7 and further discloses that the light transmissive encapsulant includes a light transmissive refractive surface coinciding with the light aperture, the refractive surface refracting light produced by the light emitting semiconductor device as it passes through the light aperture (fig. 3).

Regarding claim 9, Schoniger discloses the claimed invention as applied above in claim 8 and further discloses that the light transmissive refractive surface defines a lens that focuses the light passing through the light aperture to a focal point (col. 3, line 32).

Regarding claim 10, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that the light transmissive refractive surface is generally planar, and a surface normal of the light transmissive refractive surface is arranged at a non-zero angle with respect to an optical axis of the parabolic reflector (16, fig. 3).

Regarding claim 11, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device is a light emitting diode having a direction of strongest light emission directed perpendicularly to the generally planar reflective surface and away therefrom (col. 2, line 46).

Regarding claims 12, and 15-16, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device and the curved reflector define a light emission module, the light source including a plurality of light emitting modules arranged on the support substrate (14, fig. 1).

2. Claims 26-31, and 33-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Schoniger et al (US Pat. No 5,136,483).

Regarding claim 26, Schoniger discloses a solid-state light emitting device, and a reflector including a generally planar side (16, fig. 3) and a generally concave curved side facing the generally planar side, the solid-state light emitting device supported by the generally planar side and emitting light generally directed toward the concave curved side, the reflector further including an opening defined by edges of the generally planar side and the generally concave curved side toward which the generally planar side and the generally concave curved side cooperatively direct light produced by the solid-state light emitting device (fig. 3).

Regarding claim 27, Schoniger discloses the claimed invention as applied above in claim 1 and further discloses and further including: a translucent or transparent (10, fig. 2) filling material filling the reflector and having an light-transmissive surface disposed at the reflector opening (12, fig. 2).

Regarding claim 28, Schoniger discloses the claimed invention as applied above in claim 26 and further discloses that the light-transmissive surface defines a lens for focusing the light (fig. 1).

Regarding claim 29, Schoniger discloses the claimed invention as applied above in claim 27 and further discloses that the light-transmissive surface is arranged at a non-perpendicular angle to the generally planar side to refractively tilt the light.

Regarding claim 30, Schoniger discloses the claimed invention as applied above in claim 26 and further discloses that the generally concave curved side defines a half-parabolic reflector (fig. 3).

Regarding claim 31, Schoniger discloses the claimed invention as applied above in claim 30 and further discloses that a parabolic axis of the half-parabolic reflector lies on or near the generally planar side (fig. 3).

Regarding claim 33, Schoniger discloses the claimed invention as applied above in claim 26 and further discloses that the generally planar side and the generally concave curved side cooperatively direct light produced by the solid-state light emitting device parallel to the generally planar side (fig. 3).

Regarding claim 34, Schoniger discloses the claimed invention as applied above in claim 26 and further discloses that the generally planar side of the reflector provides primary heat sinking for the solid-state light emitting device (19, fig. 3).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 17-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Sayers (US Pat. No. 6,527,411).

Regarding claim 17 Sayers discloses a headlight for a vehicle (col. 1, line 3), the headlight comprising: a support surface (22, fig. 1), and a plurality of light emission modules (30, 32, fig. 1) each including a reflective cup (11, fig. 7) including a planar portion and a parabolic portion joined together at a parabolic interface (figs 4-7), an open end of the parabolic portion defining a light output opening (12), and a light emitting semiconductor die (18) attached to the planar portion of the reflective cup and oriented to produce light directed toward the parabolic portion of the reflective cup, wherein the light emission modules are arranged on the support surface with the planar portion of each reflective cup parallel to the support surface and the light output openings of the reflective cups arranged such that the plurality of light emission modules produce a cumulative light beam (figs 4-7).

Regarding claim 18, Sayers discloses the claimed invention as applied above in claim 17 and further discloses that light emission module further includes: a light-transmissive material that fills the reflective cup and seals the light emitting semiconductor die (col. 3, lines 55-63).

Regarding claim 19, Sayers discloses the claimed invention as applied above in claim 17 and further discloses that the parabolic portion of the reflective cup includes a reflective film disposed on the light-transmissive material (fig. 7).

Regarding claim 20, Seyers discloses the claimed invention as applied above in claim 17 and further discloses that the plurality of light emission modules include: low beam light emission modules that produce light directed at a low beam angle relative to a parabolic axis of the parabolic interface; and high beam light emission modules that produce light directed at a high beam angle relative to the parabolic axis of the parabolic interface, the high beam angle being smaller than the low beam angle (col. 4, lines 29-41).

Regarding claim 21, Seyers discloses the claimed invention as applied above in claim 20 and further discloses that the light emitting semiconductor die of each low beam light emission module has an edge aligned with a focus of the parabolic portion of the reflective cup and extends laterally away from the light output opening along the planar portion of the reflective cup (col. 4, lines 20-27).

Regarding claim 22, Seyers discloses the claimed invention as applied above in claim 20 and further discloses that the light emitting semiconductor die of each high beam light emission module is centered at a focus of the parabolic portion of the reflective cup (42, fig. 7, col. 4, line 24) .

Regarding claim 23, Seyers discloses the claimed invention as applied above in claim 20 and further discloses each light emission module further includes: a light-transmissive encapsulant material filling the reflective cup, the light transmissive material having a light-transmissive surface at the light output opening, the light transmissive surface being orthogonal to the planar portion of the reflector cup for the high beam light emission modules and the light transmissive surface being tilted

downward from orthogonal to the planar portion of the reflector cup for the low beam light emission modules (fig. 1).

Regarding claim 24, Seyers discloses the claimed invention as applied above in claim 17 and further discloses the support surface is a portion of a heat sink and the reflective cups are thermally conductive to provide heat sinking of the light emitting semiconductor die.

25. The headlight as set forth in claim 17, wherein the support surface and the reflective cups are thermally conductive and the support surface is disposed on a bumper of the vehicle, the bumper serving as a heat sink for the headlight.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 35-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoniger et al (5,136,483).

Regarding claims 35-42, Schoniger discloses a light source including: securing a light emitting semiconductor die (14, fig. 3) to a reflective planar surface (16, fig. 3) applying an encapsulant (10) over the light emitting semiconductor die to seal the die, the applying defining an encapsulant surface having an aperture side (12) and a curved side (fig. 3), and applying a reflective layer (16) to the curved side of the encapsulant, a

Art Unit: 2875

thermal capacity to provide heat sinking (19, fig. 3) fro the light emitting semiconductor die. Schoniger meets the limitation of the claims 35-42 as applied above. However, Schoniger doesn't explicitly express a method of making of the apparatus. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the light source by applying all the components as taught by Schoniger.

Allowable Subject Matter

5. Claims 13-14, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 13 is objected to because in part recites "... a support structure, a plurality of first light emission modules arranged on the support structure and emitting light directed away from the support structure at a first angle; and a plurality of second light emission modules arranged on the support structure and emitting light directed away from the support structure at a second angle different from the first angle, the second light emission modules being interspersed among the first light emission modules." This limitation in combination with the limitation of claim 1 was not shown or taught in the prior art of record. Claim 14 is objected because being depended on claim 13. Claim 32 is objected to because in part recites "...wherein the solid state light emitting device is arranged asymmetrically along the parabolic axis respective to a focal point of the half-parabolic reflector such that an asymmetrical beam pattern with a sharp cutoff is produced by the solid state light

source." This limitation in combination with limitation of claim 26 was not shown or taught in the prior art of record.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koike et al (US Pat. No 6,345,903) discloses a surface mount light emitting diode. Ignatius et al (US Pat. No. 5,660,461) discloses an array of opto-electronic devices including a heat sinking element. Stopa et al (US Pat. No 6,641,284) discloses an LED light assembly including a parabolic reflector.

7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Ali Alavi whose telephone number is (571) 272-2365. The examiner can normally be reached between 7:00 A.M. to 5:30 P.M. Tuesday to Friday. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Sandy O'Shea can be reached at (571) 272-2378 or you may fax your inquiry to the **Central Fax at (703) 872-9306**.

Ali Alavi



AU 2875